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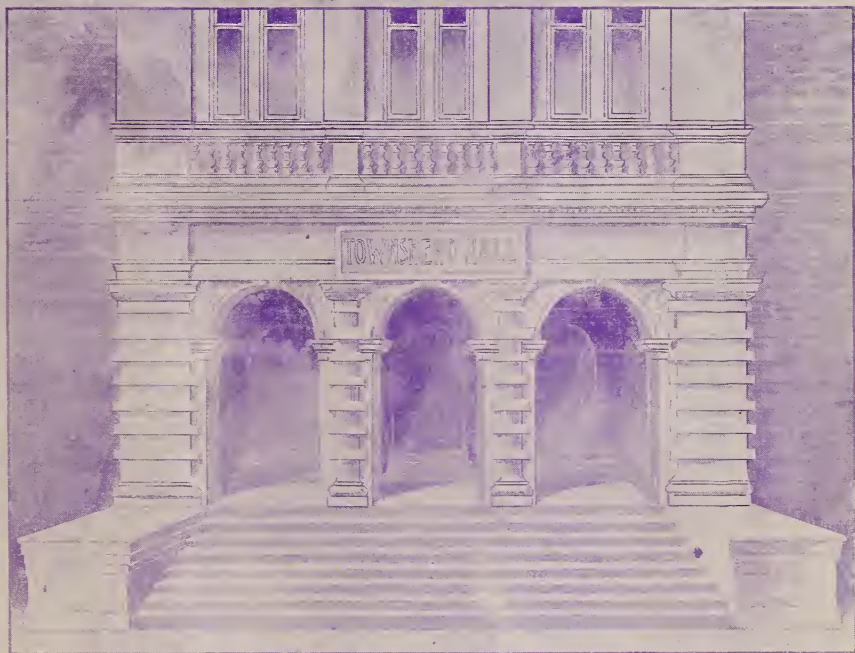
Vol. IV.

OCTOBER, 1897.

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No. 2.

THE AGRICULTURAL STUDENT



J.S. MORRILL

N.S. TOWNSHEND

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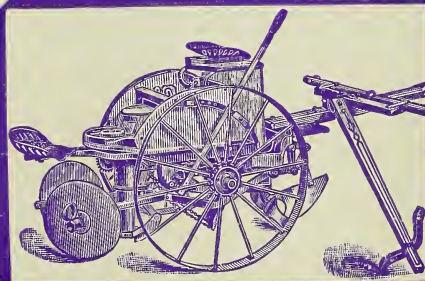
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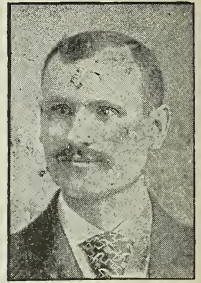
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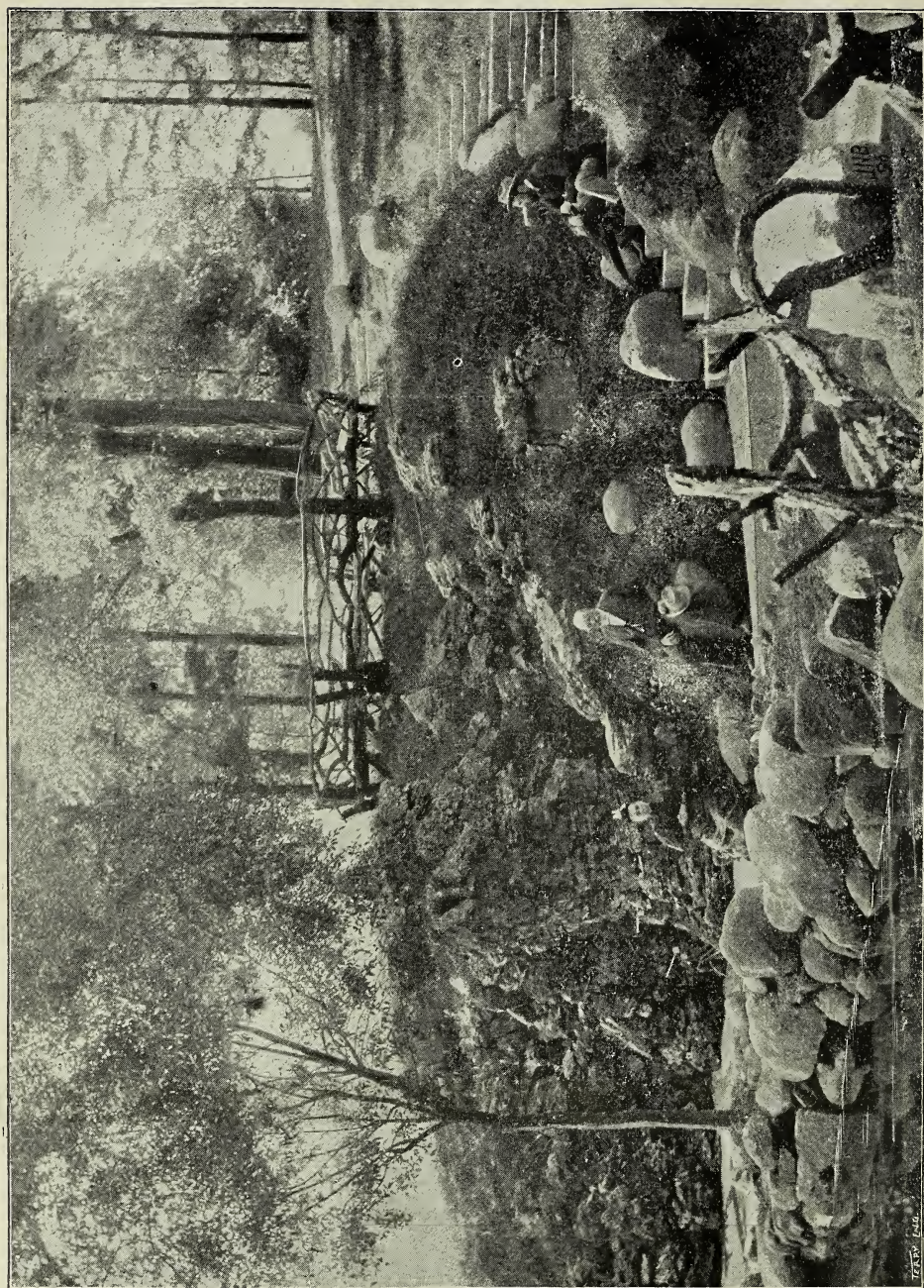
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THE UNIVERSITY SPRING.

THE AGRICULTURAL STUDENT.

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EDITORIAL CHAT.

We are indebted to Prof. Hunt for the beautiful cover in which the STUDENT appears this year. The cover is a voluntary gift, and is Professor Hunt's own design. We desire to thank him for his thoughtfulness and kindness.

All of our old subscribers, and many whom we hope to have among our subscribers, have received the September number of the Student, together with a personal note, and an envelope, stamped and addressed to us. Now, it would be courtesy at least to return the envelope with a short letter addressed to us, and while you are doing this, just slip in a money order for fifty cents to pay your subscription for the STUDENT for the coming year. You want the STUDENT, you know you do, and there is only one way to get it. This one way is universal with all good newspapers, you pay the price and we will attend to all the rest. We are glad to report a very liberal subscription from the students of the College of Agriculture, and we trust that the ex-students, alumni, and friends of the college will be fully as liberal as these, our students and friends, have been.

In its present form we cannot afford to send the Student free of charge. So, if you wish to keep in touch with the

college, send us your subscription at once.

With the return of fall, along with the bracing, frosty air and the turning of the leaves comes an old time malady which has always affected most of us quite deeply. This strange malady comes to fever heat about evening, when, their school duties of the day accomplished in a creditable manner, the persons worst affected gather upon the grid-iron and devote time, energy and brawn to the interests of foot ball, the king of manly sports.

Foot ball is strictly a college game, for several reasons. First, it takes a man to play it. Not only a man in size and brute strength, but a person possessing those rare qualities of nerve, courage, alertness and generosity, that will lead him into the thickest of the fight, and at the same time prompt him not to take undue advantage of his rival.

In the second place, to play the game of foot ball it takes science in a more limited sense than is true of most games. To devise the different strategic plays and at the same time remain within the limits of the law, requires no small amount of ability and generalship.

The prospects for a good team at O. S. U. this season looked rather poor at first, but at present things seem to be brightening up. The lack of heavy men for the line is the worst drawback, but it

is hoped that by playing a well organized and snappy game, the lack of weight can be made up for.

By the way, the Student will have an athletic department this year. In each issue the principal contests of the month will be reviewed by a competent person, and one who knows the sports about which he is writing.

Registration.

The number of students who have entered the Ohio State University up to October 1st is 925, compared with 884 at the same date last year. The number of students in the College of Agriculture and Domestic Science is 102 as compared with 81 last year. The following table gives the number of students this year in the College of Agriculture by courses and years compared with the same date of 1895 and 1896:

	1895.	1896.	1897.
Post Graduate ...	3	2	3
Four-year Courses—			
Fourth Year ..	7	4	10
Third Year	3	10	7
Second Year ..	11	8	11
First Year	16	11	35
Two-year Courses—			
Second Year ...	9	8	7
First Year	19	38	29
	—	—	—
Totals	68	81	102

Of those who have entered this fall twelve are young women, who have entered the courses in Domestic Science as compared with six last year. The number of students in the first years of the four-year and two-year courses is 64, as compared with 49 last year and 35 the year before. The students in the advanced years numbered 33 in the fall of 1895, 32 in the fall of 1896 and 38 this fall.

Townshend Literary Society.

Townshend Literary Society has lost none of her old-time life and enthusiasm, as is shown by the manner in which the work started out this term. On the evening of Friday, Sept. 23d, the society met

to elect officers for the ensuing term, and the following were elected:

President J. C. Britton
 Vice President..... V. H. Davis
 Recording Secretary..... J. S. Parsons
 Treasurer..... D. W. Galehouse
 Critic..... H. H. Loomis
 Historian A. G. Abbott
 Sergeant-at-Arms..... A. W. Nettleton

This is a competent corps of officers, and the future of the society is in very good hands. And we hope that Townshend will continue to be in the future, what she has been in the past—the most progressive society in the University.

Contributions to Zoological Collection.

The Department of Zoology and Entomology has lately been the recipient of several valuable gifts in the way of specimens for the collections.

Several rare and beautiful beetles were presented by Dr. Charles Durey, of Cincinnati. Dr. Charles B. Morrey presented the Department with his fine collection of Ohio birds' eggs. This collection contains several valuable sets. Among them are, one set of six eggs of the Great Blue Heron, taken in Franklin county; a set of ten of the Ruffed Grouse, and one or two sets of the Turkey Buzzard.

Dr. R. L. Sweeney presented the skin of a diamond rattlesnake from Florida. This is a magnificent specimen, seven feet long.

A fine specimen of the double crested cormorant was sent in by Mr. Nick Harlow, of Williamsport, Ohio. The bird was killed by him at Licking Reservoir. The bird had in its stomach three undigested lake herring; these fish are not found nearer than Lake Erie.

Columbus Horticultural Society.

The Columbus Horticultural Society held its last meeting in Botanical Hall, September 25th.

Under the head of reports of standing committees, Prof. Stephens stated that fungous diseases are uncommonly abund-

ant this fall. He referred to one on smart-weed as an example of a single species.

Prof. Kellicott reported that English sparrows had aided materially in checking the ravages of the periodical cicada in many localities this season. Also that the insect was taken in Franklin county.

Mr. Hine announced the finding of the asparagus beetle in injurious numbers in the vicinity of Medina and Akron.

Prof. Kellerman gave the results of some investigations upon formaline as a preventive of the smut of oats. He found one part of formaline to 500 parts of water to be effective, and was of the opinion that one part of the former to 1000 of the latter would give as good results.

The hall was decorated with a number of kinds of plants, and those present were invited to sample a fine plate of grapes of different varieties, all through the kindness of Prof. Kellerman and Mr. Beattie.

Prizes in Judging Dairy Cattle.

The well known firm of Holstein-Friesian breeders, W. B. Smith & Son, Columbus, Ohio, have again offered liberal prizes to the students in the livestock class of the Department of Agriculture of the Ohio State University for judging dairy cattle. They also offer prizes to the students in Dairying for excellence in cheese making.

This firm has always taken a great interest in the work of the students of the College of Agriculture of the Ohio State University, and they deserve the thanks of all progressive dairymen in promoting the cause of dairying in this practical manner.

Doings of Former Students.

The College of Agriculture of the Ohio State University is endeavoring to keep a directory of the graduates and former students of its college. Such a directory cannot help but be of interest and value in many ways. Among other

things it helps refute the oft repeated charge that students who go to agricultural colleges do not return to agricultural pursuits. It is also of direct practical interest to the students themselves. Every year the College of Agriculture of the University is receiving an increasing number of inquiries for young men to take charge of farms and gardens, and to operate creameries or cheese factories. It is obvious that if these places are to be filled at all, they must usually be filled by former students, as the students themselves do not generally wish to leave college to accept positions. It is also obvious that the college cannot be helpful to former students in this matter unless it knows where they are, and what they are doing, and whether they are in a position to accept employment.

From the directory, which the College of Agriculture of the Ohio State University is keeping, the AGRICULTURAL STUDENT selects the following items:

Mr. J. Maurice White, Rix's Mills, Ohio, is engaged with his father in general farming and stock raising, making a specialty of swine.

Mr. J. R. Reed, Yellow Springs, Ohio, of last winter's dairy school, has been engaged since the first of last March in the Wilson Jersey Creamery, owned by F. M. Wilson, Selma, Ohio. Mr. Reed expects to take further work in the dairy school this winter, which he hopes will make him a full fledged creamery operator.

Prescott Milliman is farming at Milan, Erie county, Ohio.

Philip E. Ward, Willoughby, Ohio, who spent two years in the long course in agriculture, is Superintendent of the Kirtland Public Schools. Mr. Ward has been elected president of the Lake County Teachers' Association for the ensuing year. He writes that prosperity has apparently smiled upon the AGRICULTURAL STUDENT.

Moses Craig, upon whom the degree of M. Sc. was conferred by the Univer-

sity last spring, is now Professor of Botany and Theoretical Horticulture in the Oregon Agricultural College, Corvallis, Oregon.

Mr. J. H. Bone, of the class of '96, is Assistant in Agriculture in the Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma. Mr. Bone visited the University in company with his bride, and he reports that prosperity has smiled upon him.

Mr. E. E. Bogue, formerly of Orwell, Ashtabula county, is Professor of Horticulture and Botany in the Oklahoma Agricultural and Mechanical College.

Mr. Ray Lutz, Fremont, Ohio, writes that he divides his time between his horses and peaches, but he prefers to be called a farmer.

D. J. Farnsworth is in the hardware and agricultural implement business at Waterville, Ohio.

Mr. R. W. Dunlap, of the class of '95, the well known former student and foot ball man, is now proprietor of the Congo stock farm, Kingston, Ohio, making a specialty of draft horses. At the Ross County fair he entered fourteen horses and took eighteen premiums.

Mr. John C. Phillips, of last winter's dairy school, is operating a cheese factory for Mobley & Meyers, Demos, Belmont county, Ohio. He writes that he expects to take a second course this winter in the dairy school, if he can possibly arrange to do so.

E. N. Beardsley, who was a student in the freshman year of the long course in 1895, in connection with his brother, has charge of a 340-acre farm at Canfield, Ohio. They follow dairying as a specialty, keeping about forty cows, and delivering their butter to private customers in Youngstown. Mr. Beardsley writes that he had intended to exhibit a herd of ponies at the State fair this fall, but was deterred from doing so on account of the high freight rates.

W. H. Birney reports that he is engaged in farming "at the old stand" at Tappan, Harrison county, Ohio.

Harry Conkle, of the dairy school, winter of '96, is working in his father's dairy, and has been making both butter and cheese. They keep Polled Durham cattle, and Mr. Conkle sends the milk test of Polled Durham cow Rose Bailey No. 36, for the months of March, April, May and June.

Mortimer W. Lawrence, who will be well remembered by the older students of the University, is now Vice President of the Lawrence Publishing Company, Cleveland, Ohio. This company is the proprietor and publisher of the Ohio Farmer and the Michigan Farmer.

Mr. Oscar Erf, of Monroeville, has been operating the North Eaton creamery at North Eaton, where Mr. Erf went about the first of April to open this new enterprise. Mr. Erf reports that their average for June exceeded 10,000 pounds of milk per day.

A. P. Brown, Dillon, Montana, who took the dairy course last winter, is ranching at Dillon. He writes that the coming winter he will have hay enough on hand to feed 250 head of cattle for five months, not to speak of 600 to 700 acres of pasturage. He modestly states that he does not know anything about farming, but he has a foreman who does, or thinks he does.

E. P. Mowry, of last winter's dairy school, is manager and secretary of the Kimball Co-operative Butter and Cheese Company, Kimball, Erie county, Ohio. Mr. Mowry reports that he is having good success with his trade.

Mr. Albert Whitehead, formerly of Pataskala, Ohio, writes: "I am still in charge of Mrs. J. W. Sayre's Kenmore herd of Jerseys, Lexington, Kentucky. I receive 50 per cent. more salary now than before I took the dairy course.

John L. Mendenhall is farming at Westland, Morgan county, Ohio. Mr. Mendenhall reports that since returning from the University he has taken a great interest in farmers' organizations.

Sherman Hood, class of '94, is gardening at Meander, Ohio. He visited the

University during the week of the State fair.

C. A. Hoyt is farming at Rock Creek, Ashtabula county, Ohio.

D. A. Crouner, class of '96, is dairyman from Ohio Agricultural Experiment Station, Wooster, Ohio. The butter which he made from the various breeds of cattle of the station, and exhibited at the Ohio State fair, attracted considerable attention.

Mr. C. A. Davenport has been working in a railway freight office at Chillicothe. He thinks, however, that he will return to the farm in a short time since the outlook is now more encouraging to the farmer.

A. L. Coddington is a partner in the management of a 280-acre farm at Conover, Ohio.

M. S. Pennybacker is an employe in the Purcell Mill and Elevator Company, wholesale dealers in grain and manufacturers of flour, meal and feed, Purcell, Indian Territory. Mr. Pennybacker writes: I find this country the only country for a young man, as the resources are unknown and undeveloped, but when it comes into statehood and is joined to Oklahoma, one of the grandest States of the Union will have been born. At present no man owns his farm, excepting Indians and squaw men (those with Indian wives). The crops here are enormous, and the outlook for better times is good."

Philip Baer, Jr., class of '97, is operating a co-operative creamery at Gratiot, Ohio.

C. E. Spiers, Atwater, Ohio, reports his occupation as general farming.

Mr. Roscoe F. Cass, Maumee, Lucas county, Ohio, reports his occupation as farming, and "such I expect to remain." At a recent institute meeting he read a paper on the advantages of a course at the Ohio State University.

W. D. Coe is foreman in the Urbana creamery, Urbana, Ohio. Mr. Coe writes: "The plant is new, large and well equipped. We use natural gas and the city water works. I have two assist-

ants, and we are handling 15,000 pounds of milk daily, running two 2,500 pound separators. The plant is owned by D. McCreery & Sons, who also own one at Milford Center, and did own the one at Fountain Park, that was destroyed by fire in July."

F. M. Randolph, Somerset, Ohio, has been engaged in teaching during the autumn and winter months since leaving the Ohio State University. The summer months have been spent upon the farm.

J. H. Harter is engaged in stenographic work for the Pennsylvania railroad company, and his address is 1003 Penna. Ave., Pittsburg, Pa.

Martin Schaadt, formerly of Convoy, Van Wert county, writes from Blue-mound, Kansas, and says: "I am now in Kansas operating a creamery (The Eastern Kansas Creamery Company). This is my first experience in the west. I have had good luck so far. I have been making butter ever since I took a short course at Ohio State University. I am thinking of coming back next winter to brighten up with new ideas."

W. H. Uncapher, Marion, Ohio, sends his brother to take the short course in agriculture while he remains at home on the farm.

B. M. Rutan is manager of the Lake Home herd, owned by Ben Ames, Mt. Vernon, Ohio. Since Mr. Rutan took charge, Mr. Ames has built a private creamery. Mr. Rutan says: "The commission man said our butter was the best that came to Columbus."

Mr. W. H. Baker is managing a large farm at Farmersville, Missouri, making a specialty of feeding cattle and hogs. The rise in beef cattle has been especially helpful to him. Mr. Baker visited the University recently, and has made application to do non-resident post graduate work for a master's degree.

H. C. Pemberton is engaged with D. Appleton & Co., with headquarters in Cleveland.

O. J. Vine, a well known agricultural writer of Canton, Ohio, took the special

course in dairying in the winter of '95, and reports his occupation as that of farming and dairying. He expects to spend most of the coming winter in institute work.

F. C. Ball, of Mt. Vernon, Ohio, is on the home farm.

J. M. Phillips is farming at Defiance, Ohio.

Bert H. Brechbill writes: "I have had almost steady work since leaving the Ohio Dairy School, and am now taking entire charge of our creamery here at Ayersville, Ohio.

F. L. Shaw, Newark, Ohio, exhibited Southdown sheep at the State fair this year, and took a number of premiums.

Mr. Frank Ruhlen, of the class of '96, is in charge of the farm and Holstein herd belonging to H. B. Vancleve, of the well known glass firm of Cleveland, Ohio. The farm is at Mentor, Ohio. Mr. Ruhlen has been assisted by L. R. Baldwin, Tiger, Ohio.

A former student of the University who took a two years' course in agriculture writes: "What I think of the Ohio State University, I can hardly express, but I do think that every young man and woman should take at least a short course in some college. It put a new light on life for me and made difficulties easy to pass. Although I got along first rate in my book lessons, the good that I got from them was a small fraction of the good I got from the college. I finished the course I started on, and my great regret is that I did not take the four-year course. In fact, I have talked of coming back yet, but short finances, a good wife, and a cute baby would probably interfere with study, so, unless fortune happens my way, I will be glad that I have done as much as I did, and try to make the best of the balance of life as it comes along."

Secretary Wilson.

In a letter to the Agricultural Student Secretary James Wilson has the following to say of Agricultural education:

"Agricultural education is one of the

necessities of the present age, and I am satisfied that your journal, and others similar to it, are contributing to it more than any other force. The farmer needs education along so many lines. He must needs study nature every day of his life in order to become an educated man. The old-fashioned education of the schools did not go far enough. It was good enough in its way, but our day requires a thoroughly educated farmer along all lines of industry in every department of the farm. The farmer must be familiar with the relation of the soil to the plant. The amount of moisture in the soil, the origin of the soil, how to conserve its moisture, and how to remove the moisture when the ground is saturated, are things that he must be acquainted with. He must be familiar with the plants and how they feed from the soil and air, and with the circles through which plant foods go in their journey from the soil to the plant, etc. He must be entirely familiar with animal life, its adaptation to the different latitudes and all that.

"The education of the farmer should begin with the school boy; but the great trouble just now with our school teachers is that they have not been taught along these lines."

FOOT BALL.

Present Outlook for the Season.

The outlook for a first class team at the present writing is not as favorable as it might be. The rigid rules enacted last year, in regard to athletics at O. S. U. seem to be not for the best interests (at present at least) of a representative team of any kind. Judging from the sentiments expressed by the great majority of the students, the most unnecessary rule is the one reading as follows:

"No student of this University shall play in any inter-collegiate athletic contest unless he has been in regular attendance during six consecutive months of the academic year immediately preceed-

ing July 1st, of the calendar year, in which the contest occurs."

This rule, of course, prevents all freshmen from playing foot ball. The obvious intent of the rule is to prevent all professionalism, but would not the rule requiring each student to take the required amount of college work and to keep up with his classes act in the same way?

Again, it seems unjust, as in the freshman year a man generally decides whether or no he shall take an active part in athletics. We have often noticed that it is much harder to get an upper classman sufficiently interested to take an active part in the games, than it is to interest a new man in school.

This rule has operated to weaken the team very much this fall by preventing several very good men from playing. Another rule has prevented several of the older players from being out, but nothing can be said against the rule itself. The rule referred to is the one reading, "No person shall represent the University as a contestant in any intercollegiate game or other public event who is . . . delinquent in studies." This rule is all right however hard it may seem sometimes.

The work of our new Coach, Mr. Edwards, an old Princeton man, cannot be too highly complimented. He has had a stupendous task in working up the material at hand, but has done well.

As to the outcome of the season's work we cannot prophesy, as we do not know, as yet, of whom the team will be composed.

Entomology in Washington.

Mr. J. S. Hine, Assistant Professor of Entomology, spent the summer in Washington, D. C., where he was engaged in the Division of Entomology. Regarding the opportunities for the study of entomology at Washington, he says:

"The Division of Entomology of the United States Department of Agriculture has many accomplishments which are of value to students of entomology, as well as to the practical agriculturists

of the country. Dr. L. O. Howard, the efficient Chief of the Division, has been fortunate in collecting around him a number of men who are specialists in certain lines; men who have spent years of study on some group or order of insects, and therefore are well fitted to give information to working entomologists of the country at large. The insectory under the direction of Mr. Pergande is of much interest. In this insectory are reared many insects from all parts of the United States and many foreign countries. A great deal of care is taken in rearing parasites from injurious species, since Mr. Howard is making a special study of insect parasitism, as his papers on the subject from time to time indicate.

"The student of entomology in Washington has enviable opportunities, for at his command are fine libraries and collections of insects, both of which are essential to a thorough study of the subject. If the desired reference cannot be found in the library of the Division it can most surely be obtained at one or more of the numerous libraries which are distributed through the various government buildings.

"The Division has a valuable collection of economic insects, valuable because it has been sent in by collectors, and agriculturalists from the various States, and a full record of locality, date, and conditions under which the specimen was taken are carefully kept with each individual. Besides this, the immense collections of insects in the National Museum, and various private collections contain a fair representation of the described species of insects of the United States."

The Dairy School.

The fourth annual session of the Special Course in Dairying of the Ohio State University begins on Wednesday, January 5th, 1898, and continues ten weeks. While the equipment for the work in dairying has been quite complete heretofore, the appointments have been quite meagre in comparison with

what they will be this winter. The work will be located in Townshend hall, the new Agricultural building which is being erected and equipped by the University at a cost of nearly \$100,000. Six thousand square feet of space on the ground floor will be devoted to the special work in dairying. No finer suite of rooms for this purpose can be found anywhere. The machinery and other equipment will be of the most approved kind.

The various lectures will be given by the regular professors of the University, who are experts in their several lines. The practical work in butter and cheese making will be in direct charge of Prof. Noyes, who has so successfully conducted this work the past two seasons. Besides having had five years' experience in teaching, Professor Noyes has been in practical work for more than twenty years, and at present owns and operates three cheese factories. Those who have studied butter and cheese making under Professor Noyes have been quite successful, as can be seen by referring to the article in another column of this paper, entitled "Doings of Former Students." The outlook for work in this line in Ohio for those who will prepare themselves was never brighter than at the present time.

Any person, man or woman, who has a good common education can enter the dairy school. The better the education the better the results. The University charges \$15 in fees for this special dairy course, and the total expense, including fees, room, board, books, etc., need not exceed sixty dollars, and may be less. Any young man of ordinary ability can earn enough more the first season to more than pay the total expense of the course. A postal card addressed to the Dean of the College of Agriculture and Domestic Science, Ohio State University, Columbus, Ohio, will secure an illustrated pamphlet fully describing the special dairy course.

It is often better to be silent than sarcastic.

A Letter from an Old Student.

Professor Hunt received a letter dated Aug. 23, from Mr. M. J. Persing, of Clyde, Ohio, a former student, from which we quote the following:

"The occupation of farmers on this ridge is mostly gardening and fruit growing; the principal crops being cabbage, potatoes, raspberries, strawberries, tomatoes, celery and apples, besides scattered orchards of peaches, cherries, and a few plums and grapes. Hundreds of acres of cabbage are annually raised and sold to buyers in Clyde. From ten to fifteen tons per acre is considered a fair yield, the price ranging from two to fourteen dollars per ton. Last year it sold for the former price while in the fall of '91 it started in at about six dollars, but rapidly ran up to fourteen dollars in some cases.

"We have two sauer kraut factories in town which consume many tons daily, the rest being bought and shipped to cities in several States.

"Several hundred acres of potatoes are raised each year and sold to the local buyers. The blight cut the crop very short last season. This season we have out ten acres of late and three of early potatoes. The yield will be light, and there will be many small potatoes. We have never known the Colorado Potato Beetle to be so numerous; they checked the growth of the early crop to a considerable extent in spite of all we could do. The late potatoes we planted on June 12 and 14 with an Aspinwall planter, seed being cut by hand, with two eyes to the piece. One week later the field was harrowed with a slanting tooth light harrow. Two weeks from planting they were up enough to be able to follow the rows, and we went through with a weeder similar to that of Breed's. It is our aim to go through them once a week with the sulky cultivator. We advocate shallow cultivation, throwing just enough dirt on the row to cover up small weeds that have appeared since the previous week's working.

During August, once a week is often enough to cultivate. When the potatoes commence to crack the ground and push out, we hill them up enough to prevent sun burning, and at the same time it throws some of the soil from between the rows out so that the wheels of the digger will be lower, which aids in digging. The crop is harvested with a Hoover potato digger. The potatoes are all picked up in bushel baskets, and carted in these at once to the cellar, where they are carefully piled up, being emptied but once. We have baskets and pickers enough to about keep up with the digger, thus allowing the potatoes to lay in the sun about one half hour; the sand is then dry and will fall off in handling. To escape the blight and bugs we have rigged up a spraying outfit, consisting of a barrel, pump and two spray nozzles, on a home-made cart. We used the four pound formula, Bordeaux mixture, plus 3-4 lb. Paris green. We sprayed two rows at a time, and used seven barrels on nine acres. This year we made two sprayings, one on the 19th of July, and the other on the 9th of August. We have an excellent stand, and but few vines (scattering) have blighted. They seem to be setting well and the dry weather has not wilted the vines as yet.

"I will mention the experiments with crimson clover, and close. Have had some experience with this nitrogen trap. For the past two years we have had it in our peach orchard, letting it self-seed. This year we cut about four acres, which yielded about twelve bushels of seed. It has done so well that we have sown about 45 acres at different times, and in corn, cabbage, melons and after peas. Will plow most of it under. It is difficult to get a catch of common red clover on our soil.

"I will be grateful for any information or suggestions that you may see fit to offer at any time. I try to keep abreast of the times by reading the Ohio Farmer, American Agriculturist, Rural New Yorker, Agricultural Student and the best Experiment Station bulletins."

The Education of Women.

(PERLA G. BOWMAN, ASSOCIATE PROFESSOR OF DOMESTIC SCIENCE.)

The following is from a pamphlet put out by the College of Agriculture and Domestic Science. This article was first published in the Ohio State Journal September 5, 1897:

Ohio State University established in 1896 a chair of Domestic Science and a full four years' course leading to the degree of Bachelor of Science in Domestic Science. This step was taken after a careful consideration of the needs of young women; and in the belief that something more than the usual scientific and literary courses is required, if women are to leave the University rounded and symmetrical in character, strong in body and well fitted for their special work in the world.

It has been said by a scholarly man that it is possible for a young woman to enter a university, stand high in her classes, be without criticism as to her morals, and yet to live so isolated and so entirely within the realm of books as to come out with no practical knowledge of life and its duties and with few or none of the social amenities or graces.

The great value of co-education has been settled for years. But college curricula were originally and fundamentally planned for men, and when women have chosen to enter university walls it has been to select from what was already provided. The result has been trained and broadened intellects, but intellects trained almost entirely from a man's point of view. The woman graduate finds herself possessed of general culture, with a possible foundation for the professional world; but with no special preparation for the position in which she most often places herself.

These and other conditions have led the authorities of Ohio State University to combine with courses already offered young women something of the highest forms of home training and home atmosphere; hoping to bring before students in a practical and at the same time in a

scientific way, matters which bear intimately upon family and communal life.

The history of primitive woman is an existence menial in the extreme. As the home developed, her identity became more and more closely interwoven with it; but through all the years there were hardships, overburdens and discouragements. Gradually arose the feeling with many women that man's lot was the only desirable one. The sentiment has had a powerful effect. Development made change possible, and the reaction swung the pendulum toward the extreme; the result being a tendency away from home life.

Women have studied literature, art, science, history, mathematics, with zest; almost unconscious of the momentous life questions awaiting clear minds and warm hearts. The past ten years have seen the pendulum again seeking equilibrium. Women's clubs are discussing very different matter than they would have considered a few years ago. It is not unusual to find a winter's program made up of topics bearing upon household management or matters pertaining to the health of the inmates. The lower grades in our public schools are training the children to better ideas of living. Some high schools and seminaries have introduced cooking and dressmaking. It remains for the University and the woman's college, by bringing to this work deft fingers, trained scientific minds and a definite purpose, to change the sentiment concerning the privileges and duties of American women in American homes.

In establishing the course in Domestic Science, Ohio State University has an exceedingly broad aim. There is no effort to organize a "cooking school" as such, nor to teach dressmaking and millinery as trades. Such work, isolated, certainly has no place in the University. But if the science and art of homemaking is co-ordinate with other work of the University grade, then it may be safely and wisely considered.

If it means anything, education means

an all-round development; the perfection of body, mind and soul. The proper care of humanity is beneath the notice of no one. A strong and attractive body and a charming personality are among the greatest of gifts, and can be retained only by a knowledge of the laws of health and obedience to them. How largely the possibilities of mind and soul depend upon physical conditions, is not yet clearly recognized; but if Domestic Science can train young women to more healthful, more economic, broader and more appreciative living, it certainly has its place, and a high place, among the sciences of this day.

Cookery is scarcely to be considered seriously until there is some knowledge of botany, chemistry and physiology; and the more intimate the cook's acquaintance with science, the more elevated and the better her art. The interest grows when the study of a plant has taught that in it are certain food principles in definite proportions, which may make brain and muscle, give so many foot-tons of energy, or build so much bone; if conditions are favorable. The ingredients may not be in a condition to be taken into the body with either profit or safety. Physiology has taught that certain foods must have certain preparation to become palatable and digestible. Chemistry has shown the reaction of the body fluids; and the college girl already knows how food is broken down, changed and assimilated in the body. Is it not fitting that American women should be prepared to make the best use of the great wealth of material at hand, that they should be trained to the scientific selection and preparation of what has been so lavishly placed at their disposal, and that they should know how to guard the health and thereby the morals of our people?

The health of a people means the consideration of many economic problems. It means proper housing and proper clothing. Sanitation and hygiene bear directly upon it, as do nursing in illness and first aids to the injured. "Food

Economics" means selection and preparation of foods with a view to supplying demand with the least possible expenditure; it means the adaptability of food to age, occupation, bodily condition and climate; it means, therefore, a knowledge of the comparative nutritive and money values of foods, of their preservation and adulteration, of their constituent parts and their digestibility, and furthermore of their effect in disease. When food is thus intelligently prepared it means dainty serving, charming hospitality and gracious acceptance.

It is not possible to isolate this work from regular studies. To be successful it must go hand in hand with the sciences, language and arts. What could be more reasonable than that the study of art should lead one not only to the appreciation of master paintings, sculpture, carving, architecture; but also to the masterful creation of beautiful homes, gowns and other material surroundings. As has been said, there is no effort on the part of Domestic Science to teach trades; but a young woman who completes a four years' course ought to be well able to make a livelihood in any one of several directions. Art may open many avenues of design; French, German, chemistry, history, physiology must needs mean more as she realizes that they each and all lead to a higher and more absolute knowledge of the requirements of living, and that Domestic Science makes possible the practical verification and application of many truths gleaned from these sources.

It has been said that one of the difficulties of the present college education is the helpless attitude in which graduates face the world. They may have been excellent students under the inspiration of some fine intellect, but without this guiding influence they are uncertain and insecure. There has been a failure to make the student original and independent, to mark clearly the bearing of study upon living. There can be no education too broad or too comprehensive for the preparation of home life; yet the

connecting link between the school and the family seems to have been lost, or better, perhaps, is just being forged. It is this link that Domestic Science seeks to put in place. It is believed that such a training for young women will not only make all life fuller and more useful, but will help to bridge the time between school and the serious assumption of responsibility. The return of a young woman from college ought not to be as is now so often the case, the entrance into a strange realm; but the new environment ought to appeal to her at once, urging her to activity because she is already interested not alone in political economy, but in domestic science—not alone in the history of the past, but in making the home history of the present and future. In these new surroundings she will find problems as difficult of solution, and questions as vital, as any which have before this claimed her attention. It is a psychological fact that we become interested in and learn to love that which we know most about: yet many young women of our generation are permitted, even expected, to know more of almost everything than of home and its duties and privileges. This may be so because many are sent away to school when very young, but those at home, in the stress of school life, with music or art to occupy every moment not actually required for recreation, have little energy or opportunity for home duties. Such duties to daughters of the wealthy are often almost mythical; while to the poor these duties are so real as to be a terrible burden. In neither position is the young woman able to realize their true import. The small knowledge of the one is all theoretical, of the other all practical, and both breed dislike of home work—with the first because she has no conception of its importance or meaning, with the second because she has been wrongly worked and overworked.

It is often said that the young woman in the middle walks of life has the best opportunity; and certainly the history of women seems to prove this. Our bright-

est, most capable, most brainy and most hearty women are those who are educated both in books and in practical things; who have intellect to perceive what is good, and the technical skill to secure it. Domestic Science claims more than that it can make deft fingers. It aims to cultivate memory by awakening interest; to build up scientific minds, minds which will reason and plan; to develop artistic instincts which will appreciate, beautify and elevate; to care for and train the body that it may respond to the will; to awaken a feeling for humanity which shall be far-reaching and ennobling. It may not accomplish all this at once; but questions have been raised which must be answered, a dissatisfaction is apparent which must be met, and out of these attempts some good shall come. When these first efforts have had time to bring forth results it is hoped that it may mean much for the broadening of women's lives in the home; that it may prove an inspiration to earnest and higher study outside of colleges—not for the sake of degrees or that one may boast of her textbook lore, but that she may understand life better, by so doing appreciate the living more thoroughly, and be better able to bring beauty, health and happiness to those about her.

One of the social problems of the times is the fact that wages are meager and positions scarce because of the competition of young women with young men in the ordinary business avenues. For this the education of our girls is largely to blame. The training of our schools and the sentiment of the people are unconsciously averse to the preparation of young women for home life. Our disease, "Americanitis," as it has been aptly called, has entered every department of existence; there is terrible unrest and dissatisfaction everywhere. The college graduate may not take her broadened intellect and rare knowledge to a home without feeling that she is wasting her time. She is unhappy until she can give back to the world exactly as she has gained, what she has conned from books.

It is but a short time till we find her teaching. The high school graduate has possibly much to keep her at home; but she is unaccustomed to it all, it is irksome, and according to her training rather ignoble; so she drifts into teaching or into the business college, ultimately to make a success or failure, as the case may be, but nevertheless crowding by one more the ranks of wage-earners, living always at high tension, and in the weariness of a few business years knowing almost nothing of the charm of home life. If either young woman marry, her training is thoroughly inadequate; but with the boarding house at hand it little matters for a time. When it becomes necessary to establish some sort of abode which may serve the purpose of a home, with consummate confidence she attempts to master in a few weeks what should have been the gradual and delightful acquisition of years. Too often the experience leaves an impression upon the whole tenor of the home which all concerned would gladly obliterate.

There are many young women who must go into the world of business, and who go bravely and successfully; but there are infinite numbers who enter stores, shops, factories, offices and school rooms not because it is necessary, or because they are fitted or suited for the work, but because all their friends are doing something and they must do likewise. They know nothing of home life and consequently have no desire to learn. Until some agency outside of the home takes the matter into consideration and treats it not as a weak sentiment, but as a condition worthy of scientific economic study, there is little chance for a change for the better, or that the drift of our young women will be other than toward the business world. The women's colleges, seminaries and universities, if they fulfill their mission, must offer training adequate for the responsibilities of life as most women ought to meet them and must meet them; a training which shall be broad, which shall supplement and not antagonize established principles,

which shall send women to their work cultivated in soul, mind and body, and prepared to make life brighter and better for all with whom they come in contact.

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Additional Experiments with the Smut Fungicides, Cerespolver and Liver of Sulphur.

BY PROFESSOR W. A. KELLERMAN.

An area of ground having been kindly placed at my disposal by the Agricultural Department of the University, I have been able to carry on an additional series of plot experiments for the purpose of studying comparatively the two fungicides, "cerespolver" (ceres-powder) and potassium sulphide (liver of sulphur). A brief test was also made as to the fungicidal efficiency of formalin.

Both wheat and oats were used in the experiments. The average amount of stinking smut of wheat in the untreated plots was only 3.10 per cent. The results of the experiments are consequently of little import. I will therefore omit the tabulation of the treatments and the results, but state that almost invariably the two fungicides used either reduced the percentage of smut or entirely prevented it.

In case of seed of seven of the plots, copper-sulphate was used with the cerespolver and with the potassium sulphide, but the percentage of smut was as large as when these fungicides were used without the copper sulphate. Jensen recommends the use of copper sulphate with his cerespolver, but my experiments indicate a negative result as to the advantages of the same. Formalin was used on oats, but not on wheat.

The average amount of smut in the oats when untreated seed was sown, was 20.81 per cent. The efficiency of the fungicides could therefore be very satisfactorily determined.

Especial attention was given to the comparative efficiency of sprinkling and immersing the seed. The result of the experiments is shown in the following tabulation:

Fungicide.	How Applied.	Average per cent. of smut.
Cerespolver	By sprinkling	8.02
Cerespolver	By immersion	3.78
Potassium sulphide..	By sprinkling	6.79
Potassium sulphide..	By immersion	1.17
Av. per cent. of smut in untreated plots..		20.81

It is seen that the immersion method is decidedly preferable, the smut being less by four or five per cent. Solutions were used of 1, 2 and 3 per cent. strengths; the time of immersion was 1-4, 1-2 and one hour. The tabulation of above gives the summaries and averages of the several plots. The reason for the greater efficiency of the immersion method is doubtless referable to the more thorough wetting of the individual grains. If the immersion is for a brief time, the labor involved is but little, if any, greater than in case of the sprinkling method. Thorough stirring by shoveling the seed over and over is necessary, otherwise the grain will not all be moistened by the solution, and the sprinkling will therefore be but partially efficient. The subsequent shoveling or stirring of the grain for the purpose of facilitating the drying, is the same, whichever method of treatment is adopted.

The following tabulation shows the result of the treatments with cerespolver and potassium sulphide of different strengths, and varying times of immersion:

Fungicide.	Per cent. solution.	Time of immersion.	Average per cent. of smut.
Cerespulver	1	$\frac{1}{4}$ hour	5.55
Cerespulver	1	$\frac{1}{2}$ hour	3.10
Cerespulver	1	1 hour	3.10
Cerespulver	2	$\frac{1}{4}$ hour	2.82
Cerespulver	2	$\frac{1}{2}$ hour	1.62
Cerespulver	2	1 hour	1.36
Cerespulver	3	$\frac{1}{4}$ hour	2.35
Cerespulver	3	$\frac{1}{2}$ hour	1.87
Cerespulver	3	1 hour	2.18
Potassium sulphide	1	$\frac{1}{4}$ hour	1.98
Potassium sulphide	1	$\frac{1}{2}$ hour	0.65
Potassium sulphide	1	1 hour	0.88
Potassium sulphide	2	$\frac{1}{4}$ hour	1.38
Potassium sulphide	2	$\frac{1}{2}$ hour	0.58
Potassium sulphide	2	1 hour	0.42
Potassium sulphide	3	$\frac{1}{4}$ hour	1.30
Potassium sulphide	3	$\frac{1}{2}$ hour	1.02
Potassium sulphide	3	1 hour	0.42
Av. per cent. of smut in untreated plots.			20.81

The comparisons can be easily made by inspection of the above tabulation. It is seen that the larger the immersion the less smut in the crop. There is but one discrepancy in this respect, namely, that of the cerespulver 3 per cent. one hour immersion. The count showed a larger amount of smut in case of a half hour immersion. It cannot be accounted for, but probably some accidental infection after treatment occurred.

Speaking generally, a shorter time of immersion with a stronger solution is nearly as effectual as a longer immersion with a weaker solution. A fuller series of experiments would perhaps confirm the judgment that a solution of perhaps 2 per cent. strength and a shorter immersion (say 10 to 15 minutes) should be a practical preventive of the oat smut.

An inspection of the tabulation also shows that the potassium sulphide treatments were somewhat more efficient

than those of cerespulver. The potassium sulphide used was bought of a wholesale druggist; it was perfectly secured from the air in a soldered tin can, and not opened till ready for use. The cerespulver, however, is in a conveniently pulverized form, dissolves very rapidly, and is not much more expensive than the potassium sulphide. My experiments heretofore show that it is fairly efficient, and I can continue to recommend its use, it being composed almost wholly of potassium sulphide.

Nine plots were sown to oats treated with formalin, of strengths one, two and five parts in five hundred parts of water. The time of immersion for each was one hour and two hours. This fungicide, even in case of the weakest solution and shorter time of immersion, was absolutely effectual, there being but one smutted head in each of two of the plots, but these were probably accidental. Germination tests were made by Professor Bolley which showed that the formalin is not at all injurious to the seed.

Notes on Practical Forestry.

(PROF. WILLIAM R. LAZENBY.)

I.

The growing of forest trees and the preservation, improvement and extension of existing woodland is a matter of signal importance to every citizen. The rapid and reckless destruction of our timber trees without any effort to restore the loss, is compelling those who come after us to pay for necessary wood and lumber many times the cost at which we might and should have grown it.

This improvidence is beginning to seriously affect our economic conditions. Perhaps we are not justified in thinking that our climate has materially changed during the last twenty-five or fifty years. Possibly the average annual rainfall of the different states of the Union is about the same as it was one-half a century ago.

Be this as it may, we are certain that many of our springs are failing, our creeks and rivers are becoming more and

more capricious in their flow, floods are more common, and drouths are more frequent, more severe and more protracted.

It can be laid down as a general proposition that no tiller of the soil has any moral right to cultivate more ground than he can maintain or increase the fertility of.

As an economic question it is fairly demonstrated that in proportion as the soil deteriorates the struggle is against the cultivator. He who continues to work "run down," exhausted or barren soil is hopelessly handicapped and cannot compete with the man who tills more fertile acres.

Just what effect trees have upon soil and climate is not fully understood.

History informs us that in every country where the proportion of land devoted to trees is not less than 20 per cent., or one-fifth of the whole area, the aggregate crops of that country are at a maximum.

As the total area occupied by trees falls below this amount the aggregate crop production decreases in a somewhat proportionate ratio.

In the State of Ohio at the present time only about fifteen per cent. of the total area comes under the general term of woodland, and a considerable portion of this is open wood pasture rather than forest. Probably an area of at least 5 per cent. in addition is occupied by orchards, and by scattering fruit, shade and ornamental trees.

While we may not be justified in urging planting of forest trees for the vague and not well understood general climatic effect such planting might produce, we certainly are justified in urging forest tree planting for certain specific purposes. These may be enumerated under three heads as follows:

1. For Timber.
2. For Shelter and Protection.
3. For Ornament or Landscape Effect.

For the first purpose much rough and rugged land, many ravines and steep hill-sides, in fact every acre where trees will grow that cannot be profitably plowed, or is cultivated at a loss, should be re-

clothed and devoted henceforth and forever to our most valuable varieties of timber trees.

For the purpose of shelter, belts of trees should be planted wherever buildings, stock-yards, orchards, gardens, etc., are exposed to cold, sweeping winds. Viewed in the light of economy alone such tree planting could scarcely fail to return a profit, and should not be neglected.

Under the general head of protection, the banks of streams, open ditches, steep hill sides, etc., may often be so planted with trees that they will be safe from injurious washing.

Dr Orton and other geologists make the statement that all soil is on its way to the ocean. Where the surface is level or nearly so, the march of the soil is slow. It is imperceptible. On declivities the transfer from higher to lower levels by rain and melting snow is obvious to any observer. This is especially the case where the soil is free from vegetation.

If covered with trees the washing is but slight. In marshy places the very surface of the country is dependent upon trees for its preservation, and no commonwealth having the hilly, mountainous tracts found in the Eastern and Middle States can afford to be without a considerable portion of its area in forest.

I shall barely touch upon the planting of forest trees for ornament.

There is scarcely a farm in the United States the value of which could not be greatly increased by the judicious planting of some trees, merely for ornamentation.

A place beautified by being embowered in or draped by fine shade trees will always sell for a price that more than repays all the cost of planting and care.

For whatever purpose it may be planted and grown, we should never forget that a good tree, one that has some exchangeable value, will grow just as thriftily as a poor one. The growing of forest trees is like the production of any other farm crop.

The Free Scholarship, or How He Got to College.

(Concluded.)

No one can express the anxiety that Cortus Peyton experienced during the next few days in awaiting the reply to his letters.

He had asked his brother Mark to make no mention of the matter to their parents, until he had learned something definite as to the outcome.

In a few days he received a letter from the University people, stating that there was a large amount of work to be done on the farm and campus by the students at current rates for labor. Those who were willing and anxious to work would be accommodated as far as possible. An application blank for labor was enclosed, to be filled out and returned. Cortus did this at once, and his joy was heightened by the arrival of the coveted prize, the free scholarship, certifying that Cortus Peyton had been appointed to the free scholarship in Agriculture at the Ohio State University for two years.

Cortus acquainted his parents at once about his determination to enter college that fall, and soon all his friends knew it.

George Barcus was one of the first of Cortus' friends who heard of it, and the following day he made a special trip to the Peyton homestead to see Cortus about his going.

"Yes," said Cortus, "I am going to the Ohio State University. I realize that the young man of today stands a better chance of winning success if he is educated. I know that institution is perhaps the best in the State, and one of the very best in the country."

"And one can study almost anything up there, can he not?" asked George.

"Yes; they teach practically everything, but music, medicine and Theology. I understand they have nearly one hundred instructors, in six colleges, representing thirty-four departments and twenty-seven distinct courses."

"What course are you going to take, Cortus?"

"Well, George, you may think it a little strange, but I am going to take the Agricultural course. I have a great love for agriculture and all it represents. Besides, I have been told that the opportunities for graduates in this department are as great as those in any other."

"That may be true, Cortus, but what do they teach in that department, you know all about farming?"

"Oh, there is where you mistake, George. I know nothing of scientific farming, and then they do not teach how to hoe, or how to plow, or how to milk the cows. The aim of the teaching in this department, as in all the other departments, is to make educated men. To make men think and then to act."

"I have heard quite a good deal of late," replied George, "about agricultural education, but I never knew what was taught in agriculture. What branches are to be taught?"

"Well asked; it is one of the widest of fields for study. In the line of agriculture the student studies the soil; is taught to analyze the soil, studies its physical properties, finds the number and size of the grains in the soil. He finds from this study that the exterior surfaces of the minute particles in a cubic foot of soil may equal three acres, and that soils differ largely in this particular, and the power of crop production depends in a measure upon this fact. He finds for himself from actual trial that an important difference between rock and the soil is the fact that the rock is solid and that one-half of the space in the soil may be unoccupied by soil particles. The student is taught the use of fertilizers and how to calculate their value. Is taught the manner and methods of drainage and irrigation, and of tillage, and the effect and use of various farm implements upon such processes. The history, use, and culture, climate and soil adaptation, harvesting and marketing various varieties of farm crops are carefully studied. Kinds, care and management of live stock are taught. The student is taught the characteris-

ties that each class of animals should possess for special purposes; and by means of score cards students are taught to judge the various classes of live stock. The student is taught the principles of breeding and mating animals, and is taught to understand and properly interpret pedigrees. He is taught the principles of feeding and how to calculate feeding rations which will bring the best results with the foods at hand, and for the purpose used. Butter and cheese making and testing and pasteurizing milk are most thoroughly taught with ample facilities and expert instructors. Fruit raising and vegetable growing, and greenhouse work are thoroughly taught. In addition to the large gardens, lettuce, radishes and tomatoes and other vegetables are raised by sub-irrigation, under glass. Grafting, budding, cross-fertilizing, trimming and other technical work of the horticulturist, the student is taught to do. Both forestry and floriculture are given special study. Diseases of animals, diseases of plants, insect enemies and insect friends receive proper attention; and methods of treating diseases and combating insect enemies by spraying and otherwise, are amply taught. What nicer work for study would you want than that?"

"That is very true, I see, and puts an entirely new life on this phase of education."

"I am going to study agriculture, because I think I can be of more service in that field than possibly any other. The agricultural side of life has been overlooked. The bright boys of the farm have gone into other vocations, or have remained at home and have studied no higher than the common schools. What we need to-day is educated men in agriculture, scientific trained men on the farm, and cultured young men and women in the farm home."

As the boys talked on their enthusiasm increased, but in George Barcus' soul there was planted a new idea, a germ of something that was to develop and be not unheard.

In way of history it needs but to be added, Cortus Peyton entered at the opening of the term, and four years later graduated.

During his second year's attendance at the University, George Barcus joined him in the same line of study. There were fewer in attendance then, but now their Alma Mater has the finest agricultural college in the land. Cortus Peyton often now remarks that the grandest thing he ever did was to enter the Ohio State University.

The Influence of Fertilizers on Soil Moisture.

BY PROFESSOR THOMAS F. HUNT.

This is a subject that has attracted widespread attention among those interested in tilling the soil.

The continuous culture of wheat on fertilized and unfertilized plats by the Ohio Agricultural Experiment Station presented a favorable opportunity for J. Hayes Bone, now Assistant in Agriculture at the Oklahoma Agricultural College, but then a student of the Ohio State University, to make a careful study of this subject for a thesis for graduation. The following is a brief summary of his thesis:

Free water may exist in the soil in three conditions: hydrostatic, capillary and hygroscopic. Hydrostatic water may be seen occupying the open spaces in the soil. A soil in good condition loses this soon after a rain by drainage or percolation to lower depths, where it may leave the soil permanently, or become capillary and hygroscopic water. Every particle of soil has a surface attraction for water, and when there is enough water on each for the soil to have a moist appearance, it is said to be charged with capillary water. If the soil appears dry, the moisture on each particle, though invisible, is termed hygroscopic water.

Plants need a soil that can be penetrated readily by the air and water, but do not usually send their roots into a

soil filled with hydrostatic water. They take the water they consume from the soil in which they stand. It is from the capillary and hygroscopic water that plants receive most of their water. Hygroscopic water is really capillary, the only distinction being that it adheres more closely to the soil particles.

Soil may lose water by percolation and drainage, evaporation, exhalation and consumption by plants. The water that falls from the clouds passing into the ground is attracted at once by each particle of soil. When the particles become so laden that gravity exerts the stronger force, the water begins to percolate into deeper soil, in which it may be lost from service to the plant, or may be returned by the energy of surface tension to the realm of plant roots.

Capillary water may be lost as a vapor or as a solution passing into the plant. The plant uses a small portion of this water to form its tissues, while the remainder is exhaled. The greater part of the water falling on the soil is lost to the plant. In the following experiment with oats the fallow part of the plat shows only from 1.1 to 2.8 per cent. less moisture in July than in April, although 12.64 inches of rain had fallen during the time of the experiment. The crop part shows a loss from 2 to 2.8 per cent. during the same time.

Soils have a capacity for water depending upon the arrangement and size of the soil particles. A sandy soil will allow more water to pass into it than a clayey soil, though the latter will retain more. The total water capacity of a soil is the amount of water it will hold in natural field conditions. For the soil on the Oklahoma Experiment Station farm it is about one-third. That is, if the soil is completely saturated, one-third of its weight is water. There is no doubt water enough supplied to most cultivated soils or held in them to produce abundant crops. The rainfall is usually several times that needed by the plants. Plants do well when there is from ten to fifteen percent of moisture in the

soil, but better if there is from fifteen to twenty per cent. The problem then is, the conservation of soil moisture. We know that cultivation prevents some of nature's extravagance. It has been suggested that one way of accounting for the benefit of fertilizers, is their action on the soil in relation to moisture rather than supplying plant food. Lime is used on clayey, wet soils to render them more friable. It is said to flocculate the soil particles. Nitrate of soda destroys this property, while potassium nitrate is said to increase the capillary action.

In order to determine whether soil is influenced by fertilizers, the following field experiments were conducted:

1. On wheat plats that have received the same fertilizer since the fall of 1888, daily records of soil moisture were kept during the fall of 1895 and spring of 1896.

2. On oat plats that were heavily fertilized at the time of sowing, daily records were kept during the growth of the crop in the spring of 1896. Daily records were also kept on a duplicate set of plats similarly fertilized, but left fallow.

3. On Kafir corn plats that were fertilized with manure and planted in drills, daily records were kept during the period of cultivation in the spring of 1896.

The first two fields were on the farm of the Ohio State University, while the last was on the farm of the Oklahoma Agricultural and Mechanical College.

GENERAL CONCLUSIONS.

Manure has caused the first foot of soil to be more moist. Under fallow conditions at the Oklahoma Experiment Station, manured plats showed from 0.5 to 0.7 per cent. more moisture in the general average than unmanured plats under similar conditions, from May 24th to July 16th. Under fallow conditions at the Ohio State University farm one manured plat showed 2.2 per cent. more moisture in the general average than unmanured plat under similar condi-

tions, from April 21st to July 23d. Under crop conditions at the Oklahoma Experiment Station manured plats showed from 0.3 to 0.9 per cent. more moisture than unmanured plats.

2. The method of application has a slight influence. At the Oklahoma Station, under fallow conditions, manure disked shows most influence under crop conditions. There is 0.6 per cent. more moisture on the average than when plowed under.

At the Ohio State University, farm manure spread on top shows a far greater influence than when disked in, 2.2 under fallow, and 1.9 under crop conditions.

3. Commercial fertilizers have some influence on soil moisture. Phosphoric acid seems to have a drying effect. In the oat experiment, plat 4, not fertilized, shows an average of 0.8 per cent. more moisture than plat 3, fertilized with phosphoric acid. In the wheat experiment, plat 4, unfertilized, shows 1.1 per cent. more moisture during the months of October and November, of 1895, than plat 2, fertilized with phosphoric acid. The complete fertilizer in the oat experiment shows 1.4 per cent. more moisture than plat adjoining, and unfertilized.

4. Cultivation conserves much soil moisture.

On the Kafir corn plats there is a difference of 1.5 per cent. between plats 5, cultivated four inches deep weekly, and 6, not cultivated at all under fallow conditions. Under crop conditions there is a difference of 1 per cent. between the same plats. There is a difference of 2.1 per cent. between plats 1, manure weekly, and 7, manure plowed under and weeds scraped off.

5. Frequent cultivation plats show less moisture than weekly.

Corn Binder War.

The older generation of farmers will see in the many spirited field trials between the vertical and horizontal styles of corn binders a reflection of the fierce contests which were waged between the

Marsh harvester and the reaper in the '70s, and between the early twine binders in the '80s.

Field trials rarely prove anything conclusively, but still, they have their value in waking up the farmers and getting them to study into the mechanism of the machines in question. Usually some mechanical point is at issue, each style of mechanism having its champions, but one finally proving its undoubted superiority. Just as the Marsh harvester, after a long series of bitterly fought trials, triumphed over the strongly entrenched reapers of that day, the battle being fought on the issue of mechanism and work done, just so is the horizontal, low, lying corn binder proving its superiority over the vertical types of machines.

The Deering Harvester Co., of Chicago, is the maker of the horizontal machine, while the vertical machine is represented by two companies of good standing.

The horizontal machine cuts the corn by means of a reciprocating knife very similar to a very short mower knife, three sections passing through each stalk when cut, when a couple of conveyor chains seize the corn as it naturally tends to fall backward, and guide and accelerate this motion, laying the stalks butts foremost on a low-lying binding table, where they are bound into a bundle by exactly the same binding mechanism as that of the old established Deering grain binder. The bundles, when bound, are discharged, dropping only a few inches into a folding bundle carrier, and are by it in turn dropped, only a few inches, to the ground, the bundles lying lengthwise of the row, butts foremost. On the other hand, the vertical machines, after cutting the corn, employ a multitude of chains to force the corn into a vertical position, sliding it along on its jagged butts to the binding receptacle, and wasting horse-power and draft in the attempt to pack and bind the top-heavy stalks as they stand swaying in the air. Theoretically, the vertical machines

have the advantage of making a square butted bundle because of the corn standing on its butts; but, as a matter of fact, the practical operation of the machines thus far developed is not a very good exemplification of the theory, as many of the stalks, catching in the binding mechanism, are lifted high upward and either escape the band altogether or are barely caught by it.

Makers of the vertical machines are fond of alluding to the Deering horizontal machine, contemptuously, as "sprawling" and "flat;" while farmers who have used both machines declare that the features thus characterized are the strongest points of the Deering machine. The fact that the corn is bound—where corn should be bound—lying down on a horizontal deck near the ground, makes the Deering corn binder fully one horse lighter in draft than the vertical machines; and the fact that the Deering is evenly balanced on both sides of the tongue gives it a freedom from the heavy side draft and neck weight which are such fatal objections to the vertical machines, objections which can never be removed as long as they follow the present construction of attaching the whole machine to one side of the tongue.

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The Deering Harvester Co., of Chicago, whose advertisement is found in this issue, will be glad to send circulars describing this machine, and to refer our readers to their nearest agencies, where the Deering corn binder can be inspected.

Swine Husbandry.

This is the title of a practical manual for the breeding, rearing and management of swine, with suggestions as to the prevention and treatment of their diseases, by F. D. Coburn, Secretary of the Kansas State Board of Agriculture, in a new, revised and enlarged edition;

illustrated, 310 pp, 12mo, cloth, price \$1.75; Orange Judd Company, New York.

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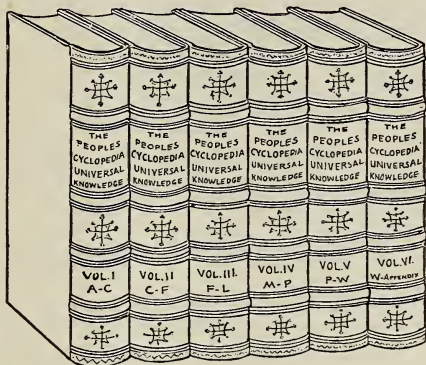
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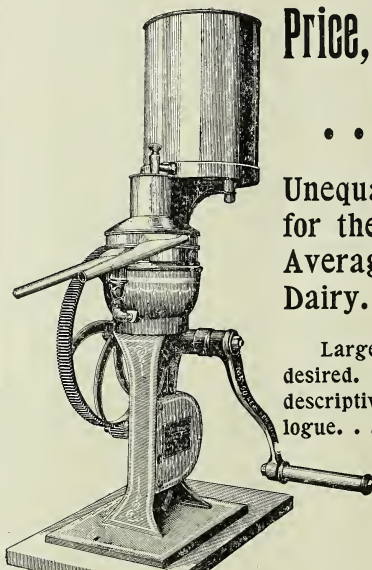
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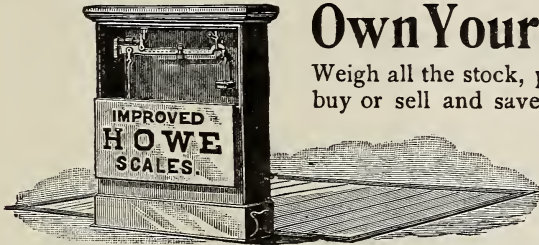
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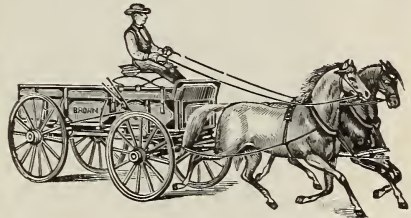
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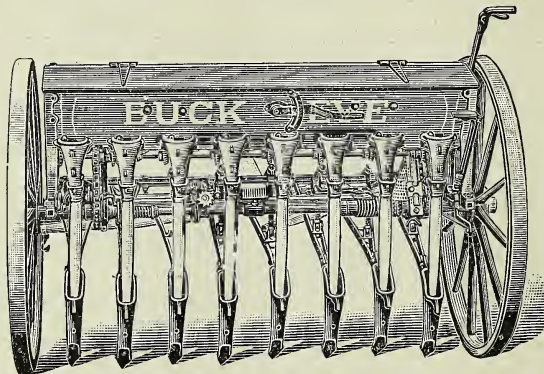
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